REMARKS

In the Advisory Action dated August 17, 2001, the Examiner indicates that the Reply after Final submitted on May 24, 2001 has been entered into the record. For purposes of Appeal, the Examiner indicates that claims 28-35 remain rejected. Claims 28-30 are amended. Claims 33 and 35 are canceled herein. No new matter is inserted into the application.

Rejection under 35 U.S.C. § 112, first paragraph

Written Description

The Examiner maintains the rejection of claims 33 and 35 under 35 U.S.C. § 112, first paragraph for allegedly containing subject matter not described in the specification. Claims 33 and 35 are canceled herein, thus rendering rejection of said claims moot.

Nonetheless, Applicants emphasize that claims 33 and 35 are drawn to a method of using the PPO gene, rather than claiming the gene itself. Therefore, contrary to the Examiner's arguments, it is not necessary that the PPO genes from the various sources as recited in former claims 33 and 35 be specifically disclosed.

The methods recited in the claims comprise many steps that work together to evaluate the ability of a compound to inhibit PPO activity. The DNA fragment is described to the specificity that is needed for it to achieve the purpose of the claim. For

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example, the DNA fragment is described in the claims as coding for the enzyme PPO which is capable of oxidizing protoporphyrinogen into protoporphyrin and which confers growth ability. Such a DNA fragment is involved in the steps in the methods recited in the claims to achieve an evaluation of the ability of a compound to inhibit PPO activity.

For these reasons, it is clear to one skilled in the art that the method claims are not limited to any specific origin and that these origins may be the genera/species listed in the former claims 33 and 35, respectively.

Applicants submit that the written description provided in the specification is sufficient and, when conveyed to the skilled artisan, shows that Applicants are in possession of the claim method.

Enablement

The Examiner rejects claims 28-35 under 35 U.S.C. § 112, first paragraph for allegedly containing subject matter not enabled by the specification. Claims 33 and 35 are canceled herein, thus rendering rejection of said claims moot. Applicants respectfully traverse the rejection applied to the remaining claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner suggests that the rejection may be overcome by

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replacing "protoporphyrinogen activity" with "protoporphyrinogen oxidase activity." In response to the Examiner's remarks, Applicants amend the pending claims accordingly.

The methods recited in the instant claims utilize a host cell deficient in growing ability based on PPO activity. In other words, the host cell cannot oxidize PPO into protophyrin absent transformation with a vector comprising a DNA coding for PPO oxidase. The growth of the transformed host cell is indicative of PPO activity, when conducted under the culturing conditions recited in the specification. Specifically, when a host cell is transformed with the DNA fragment coding for PPO oxidase, the enzyme is expressed in the resulting transformant such that it confers to growth ability that would be otherwise deficient without introducing the DNA fragment into the host cell. The use of medium containing substantially no protoheme compounds also eliminates the possibility that there is an outside source of the heme compounds sufficient to provide the growth thereof.

In this regard, no undue experimentation is required to practice the methods recited in the claims. Specifically, no undue experimentation is required to find a host cell deficient in PPO activity (i.e. methods for determining PPO activity are well known in the art (see pages 12-13 of the instant specification)), transform that cell with a vector comprising a

DNA encoding for PPO oxidase, and growing the cell on a medium free of protohemes. The specification teaches how to transform a host cell (page 10), as well as how to culture the host cell (see page 11).

Applicants respectfully submit that for all of the above reasons, the rejection for lack of enablement is overcome.

Conclusion

Applicants respectfully submit that all of the present claims define patentable subject matter such that this application should be placed into condition for allowance. Early and favorable action on the merits of the present application is thereby requested.

If there are any minor matters precluding allowance of the present application which may be resolved by a telephone discussion, the Examiner is respectfully requested to contact Kristi L. Rupert, Ph.D. (Reg. No. 45,702) at (703) 205-8000.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants hereby petition for an extension of one (1) month to October 18, 2001 in which to file this Supplemental Response to the Final Office Action. The required fee of $110.00 is enclosed herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

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overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

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CLAIM VERSION WITH MARKINGS TO SHOW CHANGES MADE

28. (Twice Amended) A method for evaluating the ability of a compound to inhibit protoporphyrinogen oxidase activity comprising the steps of:

(1) transforming with a vector a host cell deficient in growing ability based on protoporphyrinogen oxidase activity, said vector comprising a DNA fragment coding for enzyme protoporphyrinogen oxidase which is capable of oxidizing protoporphyrinogen into protoporphyrin and which confers growth ability, wherein said DNA fragment is operably linked to a promoter functional in said host cell;

(2) culturing said transformant expressing said protoporphyrinogen oxidase DNA in a medium containing substantially no protoheme compounds, wherein in a first comparative system there is a presence of a test compound to measure a growth rate of the transformant and in a second comparative system there is an absence of said test compound; and

(3) determining the ability of the test compound to inhibit the protoporphyrinogen oxidase activity by comparing the growth rates of the first comparative system to the second comparative system, wherein an inhibition of the growth rate is indicative of an inhibition of protoporphyrinogen oxidase activity by said test compound.

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29. (Twice Amended) A method for evaluating the ability of a compound to inhibit protoporphyrinogen oxidase activity, comprising the steps of:

(1) transforming with a vector a host cell deficient in growing ability based on protoporphyrinogen oxidase activity, said vector comprising a DNA fragment coding for enzyme protoporphyrinogen oxidase which is capable of oxidizing protoporphyrinogen into protoporphyrin and which confers growth ability, wherein said DNA fragment is operably linked to a promoter functional in said host cell, and a terminator functional in the host cell;

(2) culturing said transformant expressing said protoporphyrinogen oxidase DNA in a medium containing substantially no protoheme compounds, wherein in a first comparative system there is a presence of a test compound to measure a growth rate of the transformant and in a second comparative system there is an absence of said test compound; and

(3) determining the ability of the test compound to inhibit the protoporphyrinogen oxidase activity by comparing the growth rates of the first comparative system to the second comparative system, wherein an inhibition of the growth rate is [indication] indicative of an inhibition of [PPO] protoporphyrinogen oxidase activity by said test compound.

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30. (Twice Amended) A method for evaluating the ability of a compound to inhibit protoporphyrinogen oxidase activity, comprising the steps of:

(1) transforming with a vector a host cell deficient in growing ability based on protoporphyrinogen oxidase activity, said vector comprising a DNA fragment coding for enzyme protoporphyrinogen oxidase which is capable of oxidizing protoporphyrinogen into protoporphyrin and which confers growth ability, wherein said DNA fragment is operably linked to a promoter functional in said host cell, wherein said promoter is inducible, and a second vector comprising a second DNA fragment which is a DNA capable of inducing the promoter of the first DNA fragment, and a promoter, wherein said promoter is not induced by the second DNA fragment but is functional in the host cell, are operatively linked;

(2) culturing said transformant expressing said protoporphyrinogen oxidase DNA in a medium containing substantially no protoheme compounds, wherein in a first comparative system there is a presence of a test compound to measure a growth rate of the transformant and in a second comparative system there is an absence of said test compound; and

(3) determining the ability of the test compound to inhibit the protoporphyrinogen oxidase activity by comparing the growth rates of the first comparative system to the second comparative

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system, wherein an inhibition of the growth rate is [indication] indicative of an inhibition of [PPO] protoporphyrinogen oxidase activity by said test compound.

31. (Twice Amended) A method for evaluating the ability of a compound to inhibit protoporphyrinogen oxidase activity, comprising the steps of:

(1) transforming with a vector a host cell deficient in growing ability based on protoporphyrinogen oxidase activity, said vector comprising a DNA fragment coding for enzyme protoporphyrinogen oxidase which is capable of oxidizing protoporphyrinogen into protoporphyrin and which confers growth ability, wherein said DNA fragment is operably linked to a promoter functional in said host cell, and a terminator functional in the host cell, wherein said promoter is inducible, and a second vector comprising a second DNA fragment in which a DNA being capable of inducing the promoter of the first DNA fragment, a promoter, wherein said promoter is not induced by the DNA fragment but is functional in the host cell, and a terminator functionable in the host cell are operatively linked;

(2) culturing said transformant expressing said protoporphyrinogen oxidase DNA in a medium containing substantially no protoheme compounds, wherein in a first comparative system there is a presence of a test compound to

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measure a growth rate of the transformant and in a second comparative system there is an absence of said test compound; and

(3) determining the ability of the test compound to inhibit the protoporphyrinogen oxidase activity by comparing the growth rates of the first comparative system to the second comparative system, wherein an inhibition of the growth rate is [indication] indicative of an inhibition of [PPO] protoporphyrinogen oxidase activity by said test compound.

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